CHAPTER III : MINISTRY OF SURFACE TRANSPORT

3. Mumbai Port Trust

Environmental management by Mumbai Port Trust

Highlights

- **The port did not have a documented Environmental Management Plan (EMP). It did not carry out environmental management audits despite regulatory requirements, which reduced its control over environmental matters.**
- **Adequate environmental protection measures to mitigate the adverse environmental effects of new projects were not taken.**
- **Shortage of qualified manpower coupled with failure to maintain mandatory equipments purchased for environmental monitoring, combating oil spillage etc., constrained the working of the Pollution Control Cell.**
- **Old pipelines abandoned six years back were yet to be removed and were posing risk to the environment.**
- **Hazardous waste management was neglected as Mumbai Port Trust (MbPT) failed to take adequate measures to mitigate the adverse effects of sludge, slop and dirty ballast.**
- **MbPT did not properly monitor air and water quality and failed to control pollution in harbour waters. The methodology adopted by it for testing air pollutants level was not as per regulatory guidelines.**
- **MbPT did not monitor the activities of ship-breaking despite clear directives of the Supreme Court.**
- **MbPT did not attend to its responsibilities relating to the National Oil Spill Disaster Contingency Plan (NOS-DCP).**

Recommendations

- **MbPT should formulate its environmental management plan appropriate to the nature and scale of its operations.**
- **The Port should regularly conduct environmental management audits which may help the port to identify areas of concern and assess the efficacy of its environmental management practices.**

- **The old pipelines which constitute a safety hazards may be removed at the earliest to avert any possible adverse environmental impact.**
- **The air sampling may be done as per the guidelines of CPCB and all relevant parameters of air quality may be monitored.**
- **The Port should pursue with MPCB/MCGM authorities to arrange for treatment of all sewage before discharge in harbour waters.**
- **The experimental mangroves area may be developed. A physical survey may be undertaken.**
- **The oil water separator may be revamped and put to use; the matter may be pursued with the oil industry for removal of sludge.**
- **Regular visits with officials of MPCB/Maritime Board may be conducted to contain pollution due to ship breaking activities. Gas detectors may be procured and made mandatory for ship breakers to use before entering the sensitive area and taking up any 'hot work' in order to prevent untoward hazards.**
- **The Port may ensure regular attendance at annual NOS-DCP preparedness meetings. The minimum equipments as specified in NOS-DCP may be kept ready for operation by the Port and necessary training may be given to personnel under the guidance of the Coast Guard**.

3.1 Introduction

The ports and harbours straddle the interface between land and sea. Port development and operations have the potential to impact environment. The environment may be impacted due to vessels and vehicular traffic, handling and storage of materials and shore based facilities. The Mumbai Port under the administrative control of Ministry of Surface Transport (MOST) is located on the western side of a long and part-mangrove lined tidal channel that delineates Mumbai Island from the mainland and is linked to various creeks and coastal drainages. The Port is governed primarily by the Major Port Trusts Act, 1963 and to a certain extent by the Indian Ports Act, 1908 as amended and is managed by Mumbai Port Trust (MbPT). Mumbai Port has marked 133 years of its existence in 2006 as a port serving traditional cargo carriers.

3.2 Scope of audit

The performance audit of management of environment-related activities of MbPT was conducted for the period 2000-01 to 2005-06 with focus on management of air quality monitoring, water quality monitoring and waste disposal.

3.3 Audit objectives

The audit was carried out with the objective to assess the following:

- Whether the Port has an appropriate Environmental Management Plan to address its environment related responsibilities and whether it carried out Environmental Management Audit regularly and accordingly took necessary remedial measures.
- Whether the Port has been carrying out Environmental Impact Assessment (EIA) and taking mitigation measures in accordance with the relevant guidelines and directives.
- Whether the Port has taken adequate measures for monitoring and controlling air and water pollution.
- Whether the Port managed waste disposal in a manner as to minimise environmental impact.

3.4 Audit criteria

Audit criteria were derived from the various obligations placed on MbPT in accordance with the following:

- Major Port Trusts (MPT) Act, 1963.
- The Indian Ports Act (IPA), 1908 as amended.
- Water (Prevention and Control of Pollution) Act, 1974.
- Air (Prevention and Control of Pollution) Act, 1981
- Environment (Protection) Act (EPA), 1986 and rules made there under such as Hazardous Waste (Management and Handling) Rules, 1989.
- Conditions stipulated in Environmental Clearances (EC) granted for major projects during the period 1994-2005
- Environment protection measures stipulated by Ministry of Environment and Forests (MOEF) from time to time.
- Best practices regarding environmental management for port as suggested by American Association of Port Authorities' Handbook.

3.5 Audit methodology

Audit examined the documents of MbPT relating to environmental management activities and held discussion with Port management. In addition detailed questionnaires were issued and replies examined. Audit also examined relevant records of regulatory authorities viz. Maharashtra Pollution Control Board (MPCB), Mumbai and Regional Office of the MOEF, Bhopal. Organisation-specific questionnaires were also issued to Indian Coast Guard and Maharashtra Coastal Zone Management Authority (MCZMA) and their responses were taken into consideration.

Audit findings

3.6 Broad framework for management of environment

Environmental Management Plan (EMP)**,** Environmental Management System (EMS), Environmental Management Audit and Environment Impact Assessment (EIA-in respect of new projects) would constitute broad framework for management of environment. Audit Scrutiny in this regard brought out the following:

3.6.1 Absence of Environmental Management Plan (EMP)

MOEF had directed (April 1989) the Port to develop an EMP. According to the Environmental Impact Assessment Guidelines for Ports and Harbours (EIAGP&H) issued by MOEF under the provisions of EIA Notification, 1994 issued under EPA, 1986, "an EMP is an implementation plan to mitigate and offset adverse environmental impacts of a project and to protect and where possible, improve the environment. Based on the potential impacts identified, it sets out in detail, the process of implementing mitigation and compensatory measures, the timing of these measures and indicative costs. EMP should be viewed as a legal commitment on the part of proponent to control environmental impacts."

It was noticed that the Port did not have a documented EMP despite directives of MOEF and EIA guidelines. The Port accepted the audit observation and stated (May 2006) that the EMP would be developed with the help of a consultant.

Recommendation:

MbPT should formulate its environmental management plan appropriate to the nature and scale of its operations.

3.6.2 Environmental Management Systems (EMS)

An Environmental Management System (EMS) is a set of processes and practices that enable an organization to reduce its environmental impacts and increase its operating efficiency. In other words, EMS is a systematic approach towards implementation of EMP.

A study by American Association of Port Authorities (AAPA) suggested that direct labour costs of only an average of eight to ten hours per employee per year could help integrate EMS activities into a port's daily activities without any additional employees or specialists on the workforce. This study states that investment in EMS means money saved, reduced insurance premiums, regulatory incentives as well as improved management confidence in handling environmental issues. AAPA recommends that one of the best practices of public ports is the integration of EMS into an organisation's decision-making

structure to provide a healthy environment as well as to meet public demands thereby ensuring steady economic growth.

MbPT did not implement an EMS in a systematic manner. The Port accepted audit observations and stated (March 2006) that it would take steps to implement EMS and obtain ISO 14001 certification.

Recommendation:

The port should evolve a properly documented EMS in order to systematically implement its EMP.

3.6.3 Absence of Environment Management Audit

Rule 14 of Environment (Protection) Rules, 1986, stipulates that "every person carrying on an industry, operation or process requiring consent under Section 25 of the Water (Prevention and Control of Pollution) Act, 1974 (6 of 1974) or under section 21 of the Air (Prevention and Control of Pollution) Act, 1981 (14 of 1981) or both or authorization under the Hazardous Wastes (Management and Handling) Rules, 1989 issued under the EPA, 1986 (29 of 1986) shall submit an environmental audit report for the financial year ending with 31 March in Form V to the concerned State Pollution Control Board on or before the 30 September every year, beginning 1993." The requirement was made compulsory *vide* Gazette Notification dated 13 March 1992 [GSR 329 (E)].

MOEF had prescribed in its EIA guidelines, an eight-step environmental audit to be carried out by the management. The steps included *inter alia* water and energy consumption audit, inventory of materials handled, enlisting of resultant pollution, quantity of pollution, hazardous waste audit, impact of pollution control measures on the conservation plans, additional investment proposals for environmental protection and other activities like tree plantation *etc*. The guidelines require all the ports to arrange for conducting environmental management audits to determine whether environmental management procedures conform to planned arrangements to avoid any mishap, litigation and liability.

It was noticed that MbPT did not carry out any environmental management audit and therefore could not submit any environment audit report as of March 2006.

Recommendation:

The Port should regularly conduct environmental management audits which may help the Port to identify areas of concern and assess the efficacy of its environmental management practices.

3.6.4 Working of Pollution Control Cell

As per the suggestions of MOEF (June 1982), MbPT set up a Pollution Control Cell in 1983. The objectives of the cell were to devise and implement the measures for prevention and control of pollution, particularly oil pollution in the harbour. The cell was responsible for maintenance of monitoring equipments, air and water monitoring, prevention of oil pollution in outer harbour and garbage collection from vessels, public relationship and plantation work.

3.6.4.1 Deployment of inadequate Human Resources

As per the requirement of cell, the posts of one director, one deputy director, three pollution control officers, one junior assistant, five chemists, one cleaner and five 'lascars' were to be operated. MOEF in condition B (iv and x) of EC of Stage III insisted on deployment of qualified manpower including marine biologist and senior executive in the cell.

It was noticed that the Cell was not properly manned. The charge of director was being looked after by Senior Dock Master as additional charge. The post of deputy director, two out of three posts of pollution control officers, three out of five posts of chemists, the only post of cleaner and all five posts of 'lascars' were not filled up till August 2006. The posts of marine biologist and senior executive as stipulated by MOEF were also not filled up.

3.6.4.2 Poor maintenance of pollution control equipments

In order to comply with the conditions of an earlier environmental clearance (April 1989), MbPT had procured equipments or facilities, as given in the table below, to monitor and implement the programmes relating to pollution control and environmental conservation.

Pollution Control facilities

(Rupees in lakh)

Name of the equipment/ facility	Cost	Year of purchase
Marine Pollution Equipment	114.00	1991
Laboratory equipment	18.00	1991
Incinerator plant	14.16	1993
Oil water separator plant at M Shed, P&V Docks	39.90	1993
Oil water separator plant at Marine oil Terminal (MOT)	54.60	1995
APM	22.00	1992
Total	**262.66**	

Audit scrutiny revealed that the following:

- Marine pollution equipment purchased for Rs. 114 lakh in 1991 for mitigation of oil spillage was never put to use due to lack of trained staff. Even though the equipment had become unusable in 2002, the same has neither been repaired nor replaced as of August 2006.

- Out of thirty equipment procured (August/September 1991) for the laboratory at a cost of Rs. 18 lakh, only ten were in working condition (August 2006).
- Incinerator plant purchased in 1993 for Rs. 14.16 lakh was not in operation from February 1996 due to mechanical snags and was subsequently sold in August 2002, without replacement as of August 2006. Alternate arrangement for destruction and incineration of chemicals, oils and garbage was not made and the same were being drained off or emptied into dumping yards. The possible damage to the environment could not be ascertained as no studies had been conducted in this regard.
- Two oil separator plants costing Rs. 39.90 lakh and Rs. 54.60 lakh installed at M Shed in P and V Docks and at MOT in 1993 and 1995 respectively, for treatment of dirty ballast and slop generated by ships were never utilised. Dirty ballast and slop were being treated in the conventional way of decantation, i.e. allowing the oil and water to settle after which the water was being released into the sea.

In the absence of full complement of staff and non-functioning of equipment/ non-availability of equipments, the effectiveness of the pollution control cell remained questionable.

Recommendation:

Working of the pollution control cell should be streamlined so as to achieve intended objective of the cell.

3.7 Environmental Impact Assessments and Mitigation measures

MbPT sought Environmental Clearance (EC) from MOEF for four projects from August 1994 to 2005-06 and received EC and executed three projects as given below. The EC in respect of 'offshore container terminal' is yet to be received.

(Rupees in crore)

Name of the Project	Date of			Expenditure
	Application	Receipt of EC	Completion	
Replacement of submarine pipeline **(Stage I)**	August 1994	21/9/1994	9/6/2000	274.81
Modernisation of MOT Berths **(Stage II)**	March 1995	26/12/1995	28/12/2004	207.27
Replacement of Common user shore pipeline **(Stage III)**	May 2001	26/9/2001	4/6/2004	35.68
Offshore container terminal	May 2005	Yet to be received	Not applicable	1228 (estimated)

Audit noticed as follows:

3.7.1 Deficient mitigation measures

Condition (A) (vi) of EC of September 2001 for Replacement of Common user shore pipeline stipulated that "the environmental safeguard measures and the environmental management plan as given in project documents shall be effectively implemented". Audit scrutiny brought out the following:

- There was requirement for Laboratory-cum pollution control cell with necessary pollution control equipments for analysing water and waste water including sewage, air pollution monitoring and for oil matching[1]. As mentioned in paragraph 3.6.4.2, only 10 of 30 equipments for air, water and oil monitoring were in working condition (May 2006). The air samples were being collected through gas sampler and analysis made at port hospital at Wadala as the relevant equipments were not in working condition (September 2006).
- The Port was also required to have an incinerator plant at south end of Timber Pond, Sewree for the incineration of oily sludge. As mentioned in paragraph 3.6.4.2, an incinerator plant purchased (1993) ceased to operate from February 1996 due to mechanical snags and was subsequently sold in August 2002, without replacement as of March 2006. Due to this, oily sludge has been accumulating at an island in the harbour waters (MOT).
- The Port was also to be equipped with reception facilities with oil water separator with microprocessor attachment. As mentioned in paragraph 3.6.4.2, though the two oil separator plants were installed in 1993 and 1995 for treatment of dirty ballast and slop generated by ships, these were never put to use and MbPT continued to treat dirty ballast and slop in conventional way of decantation.
- The Port had proposed to convert an existing tug into a "Tug of Opportunity" fitted with pollution control equipments and also to develop oil-eating bacteria (Super Bug) in replacement of dispersant chemicals, in order to avoid the use of chemicals in destruction of molecular composition of oil. Audit observed that no action had been taken with regard to these proposed measures.

In response to audit observation, the Port stated (May 2006) that the matter would be examined.

3.7.2 While seeking (May 2005) environmental clearance for the 'Offshore Container Terminal' project, MbPT had stated that the Port had a variety of pollution control equipments and infrastructure in place. The list included Oil water separators at MOT, Ferry Wharf, APM van to measure air quality, various types of pollution control equipments, and necessary infrastructure

[1] Oil samples are taken from ship to match with samples of the oil spilled in the sea to take appropriate action against the defaulter.

including trained personnel. Scrutiny of documents of pollution control cell revealed that oil water separators at MOT and Ferry Wharf had never been put to use and that the APM had already been decommissioned in 2001, without replacement as of August 2006. Further as mentioned in paragraph 3.6.4.2, only 10 out of 30 equipments with pollution control cell of MbPT were in working condition. Further, no documents supporting training to staff could be produced to audit.

3.7.3 Old decommissioned pipelines not removed

The conditions of EC for the project relating to Replacement of submarine pipeline had stipulated that once the new pipelines are laid, the existing pipelines are to be decommissioned.

Though the new pipelines had been laid in June 2000, old and disused pipelines which approximately run for four kilometres and had been declared as a safety hazard by the Port, were not removed as of June 2006.

Recommendation:

The old pipelines which constitute a safety hazards may be replaced at the earliest to avert possible adverse environmental impact.

3.7.4 Funds earmarked for environmental protection measures

Conditions of ECs had stipulated that the funds earmarked for environmental protection measures were to be maintained in a separate account and utilised for the sole purpose of environmental safeguards. Diversion of fund was prohibited for other purposes and year-wise expenditure was to be reported to the MOEF.

MbPT had made provisions of Rs. 66 lakh and Rs. 41 lakh in respect of two projects - Replacement of Submarine Pipeline and Modernisation of MOT Berths respectively towards environmental protection fund and had spent Rs. 31.81 lakh and Rs. 8.54 lakh respectively. In respect of Replacement of Common user shore pipeline a separate fund was not provided but expenditure on environmental safeguards was made from contingency fund of the project.

Audit scrutiny revealed that the balance amounts of Rs. 34.19 lakh and Rs. 32.46 lakh in environmental protection funds were not reflected in a separate head in the annual accounts.

Recommendation:

Funds for environmental protection measures in future may be earmarked and accounted for separately and should be used for realising the targeted objectives.

3.8 Environmental Monitoring

Condition 2(xiii) of EC for Stage I, condition 2.2 of EC for Stage II and condition B(iv) of EC of Stage III required the Port to regularly monitor quality of air and water in Port area and to submit reports periodically to Regional Office, Bhopal and MPCB. The ECs for Stage II and III had been made enforceable under EPA, 1986 and hence were binding and non-dilutable. Monitoring in the Port area is the responsibility of the Pollution Control Cell of MbPT.

3.8.1 Monitoring of air quality

Central Pollution Control Board (CPCB) issued National Ambient Air Quality Standards (NAAQ) under Environment Protection Rules, 1986 and prescribed methodology for collection of air samples and its analysis. Air quality monitoring suffered from following deficiencies:

- Air sample testing was to be done twice a week at regular interval, but it was done twice or thrice a month at irregular interval.
- The parameters like SO_2, NOx, NH3, SPM, RPM, Pb and CO were to be assessed for 24-hour samples but only SO2, Nox and NH3 were assessed and that too for 2-4 hour samples only.
- The Pollution Control Cell had also not so far (March 2006) collected air quality samples from the actual project areas, though this was consistently stated as a condition of environmental clearances in each stage.
- CPCB guidelines prescribed methods of measurement as well as corresponding equipment in respect of various parameters like SO_2, NO_2, SPM, RPM and CO. Though an Air Pollution Monitoring van (APM van), equipment for laboratory and other ancillary facilities were procured in July 1992 at a total cost of Rs. 22 lakh, MbPT did not procure prescribed equipments required for monitoring purposes.
- The APM van was not in working condition since November 2001 and air monitoring reports were not submitted during the period December 2001 to December 2003.
- From December 2003, air quality monitoring was done by collecting and analysing air samples by gas samplers with testing at the Port Trust hospital. The Port submitted air monitoring reports to MOEF from 2004 onwards but reports sent to MOEF did not specify the equipments used for either collection or analysis of samples.
- MPCB authorities had also not monitored air quality independently in the Port area, as per records furnished to audit.

MbPT stated (May 2006) that efforts would be made to procure an APM van.

Recommendation:

The air quality should be monitored in respect of all relevant parameters by adequate sampling as per the guidelines of CPCB.

3.8.2 Water pollution control

As per Chapter III of Indian Ports Act, 1908, the responsibility for controlling and monitoring pollution within harbour waters rests with the Conservator of the Port. The ports have to maintain the standards of effluents as fixed under the category 'SW IV for harbour waters' as per CPCB guidelines. The norms for BOD as fixed by CPCB is <5 mg/L. Norm for COD had not been fixed by CPCB. Audit considered the norm of <180mg/L as fixed by NEERI as standard. As per EC of Stage I (1994), the Port authorities were to monitor the water quality in the harbour and send reports to the ministry, MPCB and NGOs. Following deficiencies were noticed:

3.8.2.1 Non-identification of sources of water pollution

In pursuance of condition 2(xvi) of EC of 1994, MbPT had commissioned a study in the year 2000 through National Remote Sensing Agency (NRSA), Hyderabad to gauge the levels of pollution in the harbour waters. NRSA reported (2000) higher amount of TSS and BOD due to outfalls of sewage in harbour area and suggested to investigate the sources of pollution. MbPT had also collected samples from 27 places and tested in its laboratory and analysis reports were sent to MOEF, Bhopal. MOEF observed in December 2000, February 2001, May 2001 and April 2003 that certain water pollution parameters like TSS, BOD and COD *etc.* were on the higher side. The Port informed MOEF (April 2002) of its inability to identify sources of pollution. MOEF further directed the Port (June 2002) to take help of MPCB to identify the sources of pollution and intimate the action taken. Audit noticed that the Port failed to identify source of pollution as of August 2006. There was nothing on record to show that assistance of MPCB was taken to mitigate the effects of pollution in the harbour waters.

3.8.2.2 Presence of Water pollutants beyond safety limits

Annual report of MPCB indicated that during 2005-06, Municipal Corporation of Greater Mumbai (MCGM) generated 2568 MLD of sewage of which only 973 MLD which constituted 37.89 *per cent* of total sewage, was collected through the sewerage network and processed in Sewage Treatment Plants at Ghatkopar, Bhandup, Versova and Malad. A quantity of 1595 MLD which constituted 62.11 *per cent* of total sewage, was discharged untreated through three marine outfalls at Colaba, Worli and Bandra.

As per annual report of MPCB for 2005-06 average COD and BOD levels in samples of harbour waters collected from MbPT Jetty at Chembur and Gateway of India, were in excess of safe limits as follows.

Pollutant	Safe limit	Actual observed	
		Chembur	Gateway of India
COD	180mg/l (norm of NEERI)	224mg/l	198mg/l
BOD	5mg/l	15.5mg/l	14.36mg/l,

Besides samples collected from Colaba, which falls within the harbour waters, were found to be excessive on parameters of BOD and COD as compared to standards–375mg/l (MPCB standard–5 mg/l) and 627 mg/l (NEERI standard–180mg/l), respectively.

According to Chapter III of Indian Ports Act, 1908, the responsibility for monitoring pollution within harbour waters rests with the Conservator of the Port. However, the monitoring reports submitted by MbPT to MOEF revealed that from 2003 onwards the port authorities continuously reported water pollution levels within prescribed acceptable limits.

Thus, non-identification of sources of pollution and reporting of water pollution level that was in conflict with the findings of MPCB puts question mark on the reliability of reports submitted by MbPT to MOEF. MbPT did also not send the monitoring reports to MPCB, despite directions to do so. Impact of water pollution on marine flora and fauna, mangroves, *etc*. could not be ascertained in the absence of specific studies in this behalf.

Recommendation:

The port should pursue with MPCB/MCGM authorities to arrange for treatment of all sewage before discharge in harbour waters.

3.8.3 Monitoring ecological stress on harbour

EC for Stage I required the Port to "conduct study of the flora and fauna in the MbPT area". In response a study was conducted (1999) of flora and fauna in MbPT area by National Institute of Oceanography (NIO), which concluded that there was a considerable ecological stress on harbour, deterioration of environmental quality in docks, accumulation of metals and considerable destruction of mangroves due to port activities. NIO suggested implementation of remedial measures like identification and treatment of anthropogenic (human related) discharges, avoidance of land reclamation on eastern shores, afforestation of mangroves, enforcement of MARPOL provisions, monitoring and preparation of inventory of marine flora and fauna. It also recommended reassessment of the same every two years. A report of MOEF suggests that in the Gujarat and Orissa cyclones, devastation was reported to have been lesser where sufficient mangrove buffers were present.

MbPT took action to implement provisions to collect garbage under MARPOL Convention to which India is a signatory, but subsequent reassessment every two year was not carried out. The Port also stated (March 2006) to have

planted 11300 mangrove seedlings at Trombay region, Jawahar Dweep Island, Sewree Mud Flat and behind IOC. These included about 2.5 acres of area at Timber Pond (Sewree Mud Flat) stated to have been developed as Mangrove[2] Park.

Audit scrutiny brought out the following:

- The Port could not furnish the relevant records showing the areas of experimental mangroves (macro benthos type) at Sewree Mud Flat and monitoring of the health of plants.
- There was no record to show survey of existing or newly planted mangroves conducted by Port. It was reported by Water and Power Consultancy Services (WAPCOS) (January 2006), a government agency that the mangroves were being extensively harvested for fuel.
- The other suggestions like identification and treatment of anthropogenic (human related) discharges, monitoring and preparation of inventory of marine flora and fauna were not implemented by the Port.

Recommendation:

The experimental mangroves area may be developed. A physical survey may be undertaken and measures may be initiated for preventing illegal harvesting of mangroves.

3.8.4 Monitoring of oil sludge at Marine Oil Terminal

As per rule 3 and 4 of the Hazardous Waste (Management and Handling) Rules, 2000, oil sludge is covered under categories of hazardous waste.

Though MbPT installed an oil separator plant at MOT in 1991 it was never put to use. Instead, oil tankers discharge their oil, slops[3] and dirty ballast[4], which are taken through pipelines to specified tanks. Here, the mixture is passed through a decantation method after which the water is discharged into the sea and oil sent to refineries for reprocessing.

As of April 2006, it was seen that due to accumulation over several years, 431 cu. M of sludge was found lying in the tank farm sump, oil water separator and oil collector. Though the oil industry collected useful materials like oils and slops through pipelines, no action was taken to collect unsafe materials like sludge, which was left in the Port premises leading to an environmental hazard. The possibility of fire hazard at MOT was referred to in an internal note of the staff at MOT in 2005. It was also pointed out that accumulated rain water during monsoon in these tanks was released into sea and that the

[2] Mangroves consist of a number of species of trees and shrubs that are adapted to survival in the inter-tidal zone. They play an important role as sediment repository and shoreline stabilizer. The mangrove swamp harbours a complicated community of animals. They extend to the marine areas and many productive fishing grounds of the world are found adjacent to mangrove areas..

[3] Petroleum hydrocarbon mixtures recovered and skimmed from spills and washing of equipment

[4] Seawater taken into and discharged from empty fuel tanks to maintain the stability of the vessel

possibility of oil sludge also getting washed away into the sea could not be ruled out.

As per Good Practice Guidelines for ports and harbours prepared by UK Marine Special Areas of Conservation Project, oil can impact marine life and habitats and a coating of oil on *prop roots* of mangroves could be fatal to mangrove trees.

The port did not reply to the audit queries in regard to the measures initiated for control of the oil sludge.

Recommendation:

The oil water separator may be revamped and put to use; the matter may be pursued with the oil industry for removal of sludge.

3.8.5 Non-monitoring of noise levels

While clearing a project for 'Modernisation of Ship Repairs Facilities in the Port' (August 1989) MOEF stipulated that the noise levels arising out of ship repairing activities in the repair yards should be monitored in the port area and steps should be taken to maintain it within the prescribed limits. As per conditions of EC for Modernisation of MOT Berths, adequate provision for protection of workers from noise pollution was to be made by the Port and decibel levels were not to exceed 85 dBA.

Scrutiny revealed that noise levels were not monitored despite repeated requests by MOEF. In July 2003, it was intimated by MbPT to MOEF that noise monitoring was not done due to non-availability of required facility at the port. Non-monitoring of noise levels posed a threat to the Port staff as well as its tenants. Port did not reply to audit query regarding current status of monitoring for noise pollution in relevant areas.

3.8.6 Oil Industry Safety Norms

As per section 9 and 10 of Oil Industry Safety Directorate (OISD) Standard 129, the calibration and hydraulic testing of the tanks except water tank is required to be carried out once in five years externally and once in ten years internally.

MbPT had nine tanks for storing oil and related products at MOT. Out of these, two tanks were earmarked for disposal. Similarly BPCL had got six oil tanks at MOT.

It was noticed that the Port did not carry out any testing of its oil tanks since 1994 and had no information regarding the testing of the BPCL tanks.

Recommendation:

The calibration and hydraulic testing of oil tanks may be carried out as prescribed. Similarly, it may be ensured that such testing is carried out by BPCL for their oil tanks installed in the Port premises.

3.8.7 Ballast Water Management

Introduction of harmful marine species[5] through Ballast Water[6] was identified as one of the four greatest threats to world oceans. International Maritime Organisation, under its 'GloBallast Programme' sponsored pilot studies in six locations throughout the world during 2002-03, including Mumbai Harbour covering Mumbai and Jawaharlal Nehru Ports. The report covering JNPT and MbPT was submitted in October 2003. The study identified a few species introduced in the Mumbai Harbour region due to uncontrolled ballasting. In order to formulate policies to contain the threat, the study identified the inadequacy of data as a major hindrance. In order to overcome the problem of data omission, inaccuracies therein and to effectively identify the threat to environment, suggestions like modifications in the Ballast Water Reporting Form (BWRF) putting extra care in information gathering, up-to-date information of Port officials and training to port personnel were made in the GloBallast study.

Audit noticed that the BWRF as filled in by the Ship-Master was collected and sent monthly to the Director General of Shipping, Mumbai without identifying action points for the Port.

In reply the Port stated (May 2006) that the matter involved policy decision and a decision on the same would be taken in due course.

3.9 Other related issues

3.9.1 National Oil Spill-Disaster Contingency Plan

The National Oil Spill Disaster Contingency Plan (NOS-DCP) was approved by the Government of India in November 1993 and promulgated in July 1996, within Coast Guard Act, 1978 to combat the pollution arising from oil spillage. The Coast Guard was designated as Central Co-ordinating Authority for NOS-DCP. The Ports were also made stakeholders in the plan to act independently or in co-ordination with the Coast Guard in an oil response scenario in the maritime zones of India. The responsibility of monitoring and combating of oil pollution in the port areas was entrusted to each port. It was stipulated that minimum equipments such as inflatable booms, dispersant spraying equipment, suitable dispersant chemicals, oil skimmers equipment, surface craft mounted with these equipments were required to be kept ready by the Ports. It was further stated that the necessary training was to be imparted

[5] A non-indigenous species that threatens human health, economic or environmental values.
[6] Any water and associated sediment used to manipulate the trim and stability of a vessel.

for the occasion and periodical exercises arranged under the guidance of Coast Guard to keep equipment and personnel ready for operations.

Scrutiny of records (February 2006) brought out the following:

- The equipments already procured by Port during 1991-94 were not maintained properly. The Coast Guard in their inspection report on the equipments maintained by the port observed (June 2003) damage, corrosion and deterioration to all equipments *inter alia* self-inflatable boom, multipurpose oil recovery system, dispersant spray system and mobile surface cleaning system. In spite of this report, Audit could not find any corrective action taken by the authorities to replace equipments or overhaul them adequately to meet the needs of the Port. As a result, they had been rendered unusable as of August 2006.
- The Coast Guard citing (1999) slow progress in implementing the NOS-DCP had suggested that personnel from the Coast Guard be taken on deputation till the Port officials were able to operate and maintain the equipment. However, no action was taken in this regard.
- The Port was not attending to the annual NOS-DCP preparedness meetings organised by the Coast Guard. This indicates non-compliance of the directives of NOS-DCP.

The port stated (May 2006) that the verification of position of equipments was in progress and remedial measures would be taken accordingly in due course.

Recommendation:

The Port may ensure regular attendance at annual NOS-DCP preparedness meetings. The equipments as specified in NOS-DCP may be kept ready for operation by the Port and necessary training may be given to personnel under the guidance of the Coast Guard.

3.9.2 Ship breaking activities in MbPT

An Inter Ministerial Committee meeting held in January 2005 to discuss directives of the Supreme Court relating to ship breaking activities, placed certain obligations on Port Trusts, Pollution Control Boards and State Maritime Boards. These included the following:

i. The waste generated in the ship breaking process should be classified into hazardous and non-hazardous categories and their quantities should be known to the Port authorities and State Pollution Control Board (SPCB).

ii. The Port officials should visit the ship breaking sites along with SPCB and Maritime Board officials at regular intervals.

iii. The meeting also directed that since ‘gas free’ certificates obtained by operators before commencement of activities had remained unmonitored during the activity period, authorities at Mumbai Port

should procure good quality gas detectors. These should be made mandatory for use before entry of operators to sensitive areas for undertaking 'hot work'.

It was noticed that the Port did not procure the stipulated gas detectors nor did it have records to show compliance with directives of the Supreme Court.

In reply the Port stated (March 2006) that the primary responsibility of disposing of hazardous waste lies with the ship breakers and the responsibility of monitoring and disposal of the waste in safe manner rests with MPCB. Further it was stated that the Port officials visit the sites regularly and impress upon the ship breakers regarding the implementation of the directives. It was also mentioned that it was not clear from the minutes of the meeting whether gas detectors were to be procured by the Port or ship breakers themselves.

The reply is not tenable as the directives of the Supreme Court were made applicable to the MbPT by the Committee. Supreme Court directives specifies that port officials should visit the sites along with MPCB/Maritime Board officials at regular intervals and reports submitted. However, no such joint visits were undertaken at any time. Similarly, the procurement of gas detectors was entrusted to the Port and there was no ambiguity in the directives.

Recommendations:

- *Regular visits with officials of MPCB/Maritime Board may be conducted to monitor ship breaking activities and reports submitted.*
- *Gas detectors may be procured and made mandatory for ship breakers to use before taking up any 'hot work' in order to prevent untoward hazards.*

3.9.3 Non-compliance with provisions of Batteries (Management and Handling) Rules, 2001

According to the definition given in the rules, the Port is covered as 'Bulk Consumer' and 'Auctioneer' in respect of batteries. The duties of bulk consumer include ensuring that the batteries are disposed off in auction to registered recyclers only and a six-monthly compliance report in Form VIII is submitted to the MPCB. Similarly, the auctioneer has to maintain a record of such auctions and make these records available to the State Board for inspection and submit six-monthly compliance reports in Form IX to the MPCB. Though the Port auctioned batteries to registered recyclers, it did not send the reports in prescribed forms to MPCB**,** either in its capacity as bulk consumer or auctioneer.

In reply the Port stated (May 2006) that the instructions would be strictly complied with.

3.9.4 Operation without 'Consent to Operate'

As per the provisions contained in Section 26 of Water (Prevention and Control of Pollution) Act, 1974, Section 21of Air (Prevention and Control of Pollution) Act, 1981 and Rule 5 of Hazardous Waste (Management and Handling) Rules, 2000, the Port is required to obtain a 'consent to operate' from the Maharashtra Pollution Control Board. MPCB asked (January 2001 and August 2001) the Port to obtain 'Consent to operate' as required by law. MOEF also in February 2001 had opined that MPCB should take appropriate action under Section 33 and 33(A) of Air and Water Acts if the port failed to get the consent.

Audit observed that the Port had not obtained a valid 'Consent to Operate' as of May 2006. The Port accepted the audit observation and replied (May 2006) that 'Consent to Operate' would be obtained from MPCB.

3.9.5 Non-payment of water cess by MbPT

According to Section 3 of the Water (Prevention and Control of Pollution) Cess Act, 1977 as amended a water cess shall be payable by every person carrying on any industry and every local authority, and shall be calculated on the basis of the water consumed. Industry included any operation or process, or treatment or disposal system, which consumes water or gives rise to sewage effluent or trade effluent, excluding hydel-power units. Consumption of water includes supply of water. According to Section 10 of the Act, interest at the rate of two *percent* for every month or part of a month comprised in the period from the date on which such payment is due till such amount is actually paid. Similarly, as per section 11 of the Act, penalty not exceeding the amount of cess in arrears is also leviable.

It was noticed that the Port had never paid water cess as of May 2006.

3.9.6 Role of Regulatory Authorities

MPCB and MOEF are two main regularity authorities which have the responsibility of ensuring that the Port adequately attends to its environment related responsibilities.

3.9.6.1 MPCB

It was seen from the records that MPCB authorities did not adequately monitor environmental parameters in MbPT premises though ports come within the red category classification. Independent sampling of air quality was not done by MPCB in the Port areas till 2006. Also, though two water stations (MbPT jetty at Chembur and Gateway of India) in the harbour waters were monitored by MPCB, the monitoring programme did not cover the rest of area of the Port.

3.9.6.2 MOEF

The clearance to various projects of the port was given by the MOEF based on mitigation plans and other environmental protection measures stated to be available with the Port. The MOEF officials conducted inspection visits but did not monitor and verify the implementation of mitigation measures committed by the Port. Further, though periodical reports of air sampling were sent to the Regional Office, MOEF did not comment on the monitoring methodologies that were not in accordance with relevant CPCB guidelines.

3.10 Conclusion

Considering its location in the heart of the financial capital of the country and increased public concerns over sustainable development, a concerted effort from the Port with respect to continuous vigilance over environmental issues was warranted. The Port did not have a systematic documented environmental management plan and did not conduct environmental management audits. The Port's pollution control cell was not adequately equipped. The port also failed to control pollution of harbour waters.

The Port needs to attend to its environmental responsibilities through a concerted action plan with particular focus on compliance with the environmental legislative requirements. A comprehensive EMP along with periodical Environmental Audit, coordination with MPCB and MCGM to ensure treatment of sewage and use of improved disposal methods for oil slops and dirty ballast may help improve environmental conditions.

3.11 Acknowledgement

The audit plan and audit objectives were discussed in January 2006 with the Dy. Conservator, who is primarily responsible for environmental matters at the Port. Meetings with the top management as well as departmental heads were also conducted. We acknowledge the cooperation of the management during the course of audit

The matter was referred to the Ministry of Shipping and Environment and Forests in October 2006; their reply was awaited as of December 2006.

(Dr. A.K. BANERJEE)
New Delhi **Director General of Audit**
Dated **Central Revenues**

Countersigned

New Delhi **(VIJAYENDRA N. KAUL)**
Dated **Comptroller and Auditor General of India**